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Characterizing NIF hohlraum energy and particle transport using mid-Z spectroscopic tracer materials J. D. MOODY, LLNL, M. A. BARRIOS, Insight Datascience, K. WIDMANN, L. J. SUTER, D. A. LIEDAHL, M. B. SCHNEIDER, D. B. THORN, W. A. FARMER, O. L. LANDEN, R. L. KAUFFMAN, C. JARROTT, M. W. SHERLOCK, H. CHEN, O. JONES, S. A. MACLAREN, D. EDER, D. J. STROZZI, N. B. MEEZAN, A. NIKROO, J. J. KROLL, S. JOHNSON, LLNL, J. JAQUEZ, H. HUANG, GA — Line emission from mid-Z dopants placed at several spatial locations is used to determine the electron temperature (T_e) and plasma flow in NIF hohlraums. Laser drive ablates the dopant and launches it on a trajectory recorded with a framing camera. Analysis of temporally streaked spectroscopy provides an estimate of the time-resolved T_e. The estimated temperature gradients show evidence for significantly restricted thermal conduction. Non-local thermal conductivity can account for part of this; additional effects due to magnetic fields, return-current instabilities, ion acoustic turbulence and other physics are considered. We describe our findings and discuss interpretations. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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